



Mr. Robert Stone  
Hazardous Materials Specialist  
Humboldt County Health Department  
Division of Environmental Health  
100 H Street, Suite 100  
Eureka, California 95501

March 24, 2006

**Re: Workplan for Vertical Delineation  
Former Cash Oil Arcata  
421 J Street, Arcata, CA  
HCDEH LOP No. 12302  
Blue Rock Project No. NC-3**

Dear Mr. Stone,

This workplan for vertical delineation of MTBE in soil and groundwater at 421 J Street, Arcata, Humboldt County, California (site) (Figure 1), was prepared for Clyde Harvey by Blue Rock Environmental, Inc. (Blue Rock), and is submitted in response to the Humboldt County Department of Environmental Health (HCDEH) letter of March 9, 2006, which requested vertical delineation of MTBE below the site.

## **Background**

### Site Description

The former Cash Oil Arcata service station is located on the corner of J Street and Samoa Boulevard (State Highway 255) in Arcata, California (Figure 1), in an area of low topographic relief on the Arcata Bottoms.

### Former Underground Storage Tanks

A gas station has occupied this site since approximately 1978. The Cash Oil Company began operating the station in 1989. In 1997, permission was granted by the HCDEH to upgrade the existing underground storage tanks (USTs). The UST system consisted of two (2) upgraded single-wall steel 10,000-gallon USTs and one (1) fiberglass 10,000-gallon UST. The USTs were located along the northern edge of the property and were plumbed to two (2) dispenser islands located in the center of the property (Figure 2). At the time of upgrade, the UST system was used to store and dispense unleaded gasoline.

In May 2000, Cash Oil Company sold the property and upgraded UST system to Golden Gate Petroleum of Martinez, California.



In January 2004, Beacom Construction (Beacom) of Fortuna, California, on behalf of Golden Gate Petroleum, removed the (3) 10,000-gallon USTs and associated fuel dispensers from the site.

On March 18, 2004, Beacom installed two (2) new 10,000-gallon USTs at the site. During the installation of these USTs monitoring well MW-1 was destroyed.

#### Discovery of Petroleum Release

In May 1997, during tank upgrade activities, soil and groundwater samples were collected from two borings (B-1 and B-2) that determined a release of petroleum had occurred from the UST system.

#### Site Investigation History

Subsurface investigation has been ongoing at the site since initial 1997. A total of approximately nine (9) borings (B-1 through B-3 and B-6 through B-11) have been drilled and seven (7) monitoring wells (MW-1 through MW-7) have been installed to date. Additionally, numerous soil and groundwater samples have been collected from boring, wells, and/or excavations through the course of corrective action at the site. Historical boring, well, and sample locations are shown on Figure 2, well construction data are summarized in Table 1, soil sample data are summarized in Table 2, and groundwater elevation and sample data are included in Table 3.

#### Petroleum Type Detected During Investigation

Through the course of investigation the following petroleum compounds have been detected in soil and/or groundwater samples: total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert-butyl ether, tert-butanol, tert amyl methyl ether (MTBE, TBA, TAME), methanol, and ethanol. The fuel additives methanol and ethanol have only been detected sporadically at low concentrations, and the additives di-isopropyl ether (DIPE) and ethyl tert-butyl ether (ETBE) have not been detected.

#### Summary of Hydrogeology

A total of approximately 15 individual borings (including temporary borings and those converted to wells) have been drilled and logged at the site. The maximum depth explored has been 20 feet bgs. Clays and silts have been logged mostly from baserock to the depth of 20 feet bgs. An isolated, thin bed (i.e. <2 ft thick) of sand was observed in MW-5 at a dept of 5 feet bgs. Additionally, sand was observed from 19 to 20 feet bgs in MW-5 and MW-7, but this sand was not observed in any of the other five wells drilled to 20 feet bgs. Based on currently available information, neither of these sands appear to be laterally continuous. Cross sections are shown on Figures 2a and 2b.

During drilling, groundwater has been first observed at depths ranging from approximately 5 to 10 feet bgs. Groundwater in the temporary borings and wells stabilizes around a depth of 5 feet bgs, with seasonal variations ranging from approximately 4 to 8 feet bgs.



Monitoring wells MW-1 through MW-7 have all been screened from 5 to 20 feet bgs. The monitoring wells appear to adequately monitor conditions of first encountered shallow groundwater in the silts and clays beneath the site.

Groundwater elevations from monitoring wells MW-1 through MW-7 were used to evaluate flow and gradient in the shallow water bearing zone since November 2001 (when installation of wells MW-5, 6, and 7 completed the current suite of wells) to November 2005. Groundwater elevations have ranged from approximately 8 to 12 feet msl (equating to depths of approximately 4 to 8 feet bgs). Groundwater flow during the 17 events evaluated has been consistently to the south-southeast at gradients ranging from approximately 0.005 to 0.015 ft/ft (Figure 3). This flow direction is consistent with local topography and toward the nearest surface water body (Arcata Marsh) located approximately 1,400 feet south of the site.

#### Summary of Remedial Activities

Clearwater Group (Clearwater) submitted a *Corrective Action Plan (CAP)*, dated May 10, 2002 to the HCDEH. The *CAP* presented a summary of the hydrogeology and contamination. The report evaluated remedial alternatives and concluded that a combination of source soil removal, groundwater extraction from open excavation, and enhanced bioremediation using oxygen releasing compounds (ORC) would be the best remedial alternative for the site. An enhanced bioremediation background study was proposed in the *CAP*. Preparation of a *CAP* was requested by the HCDEH in a letter dated March 13, 2002. The *CAP* was approved by the HCDEH in a correspondence letter dated May 21, 2002.

Clearwater submitted a *Remedial Action Plan (RAP)*, dated February 14, 2003 to the HCDEH for review. The *RAP* presented results of natural attenuation pilot testing and details for the excavation of impacted soil, excavation dewatering activities, and the use of enhanced bioremediation (ORC). These remedial activities were based on working in conjunction with future site renovation activities.

In January 2004, Clearwater supervised Felt Mountain Construction of Corning, California in removal of the existing UST system. Soil samples collected for UST system removal contained detectable levels of TPHg, BTEX, MTBE, TBA, TAME, and lead (Pb) (Table 2). Additionally, a pit water sample was collected on January 15, 2004, which contained detectable concentrations of TPHg, BTEX, MTBE, TBA, and TAME. A subsequent pit water sample on January 20, 2004 also contained detectable concentrations of Pb (Table 3).

Remedial excavation activities followed immediately after the UST removal. The area of the excavation covered the majority of site (approximately 3,600 ft<sup>2</sup>), except for the northeast corner where the building was located, and dug to a maximum depth of 12 feet bgs (Figures 2a & 2b). Well MW-1 was destroyed earlier, in preparation for remedial excavation and installation of new USTs. Well MW-3 was destroyed during excavation activities. Approximately 2,332 tons of petroleum impacted soil was excavated and transported to BioIndustries in Red Bluff, California for disposal. Approximately 13,000 gal. of petroleum impacted groundwater was pumped from the excavation, and transported to the Seaport facility in Redwood City, California for disposal.



During excavation activities, soil samples were collected from (1) excavated soil to document source removal and (2) final excavation dimensions to verify clean-up (Table 2).

Blue Rock estimated the TPHg mass removed in soil excavated using the average TPHg concentration of excavated soil and total excavated soil mass.

Blue Rock estimates that approximately 1,548 lbs of TPHg were removed from the site through soil excavation.

The reduction in TPHg soil mass was intended to remove, or at least significantly reduce, the secondary source of groundwater impact, which results in continued partitioning of petroleum from the sorbed-phase to the dissolved-phase. If the sorbed-phase source is removed, partitioning of petroleum to the dissolved-phase decreases. This condition should result in declining dissolved-phase concentration over time following the excavation. In order to accelerate the decline in dissolved-phase petroleum compounds, Clearwater mixed approximately 1,020 pounds of oxygen-release compound (ORC) into the excavation backfill placed at or below the water table. ORC is designed to release oxygen into the groundwater slowly over time for the purpose of elevating dissolved-oxygen levels to support enhanced aerobic biodegradation of the residual dissolved-phase plume.

Remedial activities are presented in Clearwater's *Remedial Report of Findings*, dated February 10, 2004. The HCDEH concurred with Clearwater's recommendations in a letter dated March 8, 2004.

On March 18, 2004, Beacom pumped approximately 10,000 gallons of groundwater from a UST installation excavation proximal to MW-1. On March 29 and 30, 2004, Blue Rock discharged approximately 10,000 gallons of groundwater under permit that contained acceptable levels of MTBE into the City of Arcata's sewer system. Remedial activities are presented in Blue Rock's *First Quarter 2004 Groundwater Monitoring Report*, dated April 5, 2004.

### **Workplan for Vertical Delineation**

The purpose of this phase of work is to (1) evaluate the vertical extent of MTBE in soil below 12 feet bgs, and (2) evaluate the vertical extent of MTBE in groundwater below 20 feet bgs, as requested in the HCDEH letter dated March 9, 2006.

In order to accomplish the first goal, two soil borings are proposed. These borings are proposed in locations where MTBE appears to increase at depth in shallow soil samples previously collected at the site. Blue Rock proposes the installation of two soil borings with soil samples collected at depths of approximately 15, 25, and 35 feet bgs (Boring locations shown on Figure 6):



- DB-1: Located along the southern edge of the former USTs and where MTBE was detected at 1.7 mg/kg at 12 feet bgs. Samples will be collected in native material below the remedial excavation limits.
- DB-2: Located downgradient of the former USTs/dispensers in native material outside of the remedial excavation adjacent to MW-2.

In order to accomplish the second goal, collection of deeper grab groundwater samples is proposed. Grab groundwater samples will be collected from at depths of approximately 25 and 35 ft bgs in each boring. The proposed drilling locations are shown on Figure 6:

- HP-1: Located along the southern edge of the former USTs and where MTBE was detected at 1.7 mg/kg at 12 feet bgs.
- HP-2: Located downgradient of the former USTs/dispensers and in native material outside of the remedial excavation adjacent to MW-2.
- HP-3: Located downgradient of the former USTs/dispensers and MW-2 in native material adjacent to MW-6.

#### Drilling and Soil Sampling

Prior to drilling, Blue Rock will prepare site specific Health and Safety Plan and obtain soil boring permits from HCDEH. Prior to conducting and drilling, the site will be marked by Underground Service Alert to identify utilities leading to the site. Additionally, a private utility locator may be employed to clear exact drilling locations.

A Blue Rock scientist, working under the supervision of a Blue Rock California Professional Geologist, will supervise all drilling activities. Drilling will be performed by a C-57 licensed driller using a direct-push drilling rig. Drilling will be accomplished with a large bore double-tube system to facilitate soil sampling below the backfill material. During drilling, soil samples will be collected at 15, 25, and 35 feet bgs. The Blue Rock scientist will log soil types in accordance with the Unified Soil Classification System. Additionally, soil samples will be screened for the presence of volatile petroleum hydrocarbon vapors with a photo-ionizing organic vapor meter (OVM).

These samples will be covered with Teflon lined plastic caps, labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

#### Vertical Delineation Drilling and Grab Groundwater Sampling

Drilling and sampling activities for vertical delineation of groundwater impacts will be accomplished using a direct-push drill-rig, equipped with 1.5-inch diameter drill-rod, to collect grab groundwater samples from a discrete depth. Again, drilling will be performed by a C-57 licensed driller under the supervision of a Blue Rock scientist. Because the deepest screened wells at the site are only 20 feet bgs, discrete depths for vertical delineation will be deeper than



those wells. A discrete depth intervals of approximately 25 and 35 feet bgs will be targeted for grab groundwater sampling.

The deeper groundwater samples will be obtained by driving an expendable sampling tip, coupled to tubing back to the surface, to the desired sampling depth. At the desired depth, the tip will be retracted slightly to expose the screened portion of the tool. Grab groundwater samples will then be collected in appropriate containers, labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

#### Soil and Groundwater Sample Analyses

Soil and groundwater sample analyses will be performed by a DHS-certified laboratory.

The soil samples will be analyzed by a California DHS-certified laboratory for:

- TPHg, BTEX, and MTBE by EPA Method 8260B

The groundwater samples will be:

- TPHg, BTEX, and MTBE by EPA Method 8260B

#### Decontamination and Management of Investigation Derived Soil and Water

Prior to, and between, use all downhole drilling and sampling equipment will either be steam-cleaned or washed in an Alconox® solution followed by double rinse in clean tap water. Soil cuttings and auger/sampler rinseate will be stored in labeled 55-gallon drums on-site pending appropriate disposal. Blue Rock will utilize the analytical results for soil and/or water samples collected from the borings to coordinate soil and water recycling/disposal.

#### Reporting

Blue Rock will prepare a report following this phase work. The report will include description of field and laboratory methods, results, discussion/interpretation, and recommendations, as conditions warrant. The report text will be supported by tabulated data and drawings. The report will be prepared under the supervision of, and signed by, a California Professional Geologist at Blue Rock.



## Certification

This workplan was prepared under the supervision of a California Professional Geologist at Blue Rock. All statements, conclusions, and recommendations are based upon published results from past consultants, field observations by Blue Rock, and analyses performed by a state-certified laboratory as they relate to the time, location, and depth of points sampled by Blue Rock. Interpretation of data, including spatial distribution and temporal trends, are based on commonly used geologic and scientific principles. It is possible that interpretations, conclusions, and recommendations presented in this report may change, as additional data become available and/or regulations change.

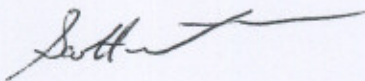
Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Blue Rock has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

If you have any questions regarding this project, please contact us at (707) 441-1934.

Sincerely,  
Blue Rock Environmental, Inc.

Prepared by:



Scott Ferriman  
Project Scientist

Reviewed by:



Brian Gwinn, PG  
Principal Geologist



Attachments:

- Table 1: Well Construction Details
- Table 2: Soil Analytical Data
- Table 3: Groundwater Elevations and Analytical Data
- Figure 1: Site Location Map
- Figure 2: Site Plan
- Figure 2a: Cross-Section A-A'
- Figure 2b: Cross-Section B-B'
- Figure 3: Groundwater Flow Direction Rose Diagram
- Figure 4: Post-Remediation MTBE in Soil – 1/04
- Figure 5: MTBE in Groundwater Post-Remediation – 11/05
- Figure 6: Proposed Boring Locations for Vertical Delineation

Distribution:

- Mr. Clyde Harvey, 1785 Fort Douglas Circle, Salt Lake City, UT 84103
- Mr. Dennis O'Keefe, Golden Gate Petroleum, 501 Shell Ave, Martinez, CA 94553



**Table 1**  
**WELL CONSTRUCTION DETAILS**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Identification	Date Installed	Installed by	Casing Diameter (inches)	Total Depth (feet)	Blank Interval (feet)	Screened Interval (feet)	Slot Size (inches)	Filter Pack (feet)	Bentonite Seal (feet)	Cement (feet)
MW-1	8/31/00	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
(MW-1 was destroyed in 3/04 for installation of the new UST system.)										
MW-2	8/31/00	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
MW-3	8/31/00	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
(MW-3 was destroyed in 1/04 for remedial excavation.)										
MW-4	8/31/00	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
MW-5	11/8/01	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
MW-6	11/8/01	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5
MW-7	11/8/01	Clearwater	2	20	0-3	3-20	0.02	2.5-20	1.5-2.5	0-1.5



**Table 2**  
**SOIL ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Sample ID	Sample Depth (feet bgs)	Sample Date	TPH <sub>g</sub> (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)	Lead (mg/kg)
<i>Soil Samples Collected at UST Removal</i>															
SW-1@8'	8	1/15/04	<1	<0.005	<0.005	<0.005	<0.005	0.16	0.022	<0.005	<0.005	<0.005	--	--	8.59
SW-2@8'	8	1/15/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.005	<0.005	--	--	--
SW-3@8'	8	1/15/04	2.2	0.15	0.56	0.043	0.21	1.0	<0.025	<0.005	<0.005	<0.005	--	--	--
SW-4@8'	8	1/15/04	6.2	<0.005	<0.005	<0.005	<0.005	0.38	0.64	<0.005	<0.005	<0.005	--	--	4.22
SW-5@8'	8	1/15/04	13	0.24	0.60	0.059	0.094	8.8	0.60	<0.025	<0.025	0.063	--	--	--
SW-6@8'	8	1/15/04	<1	<0.005	<0.005	<0.005	<0.005	0.034	0.017	<0.005	<0.005	<0.005	--	--	7.33
D-1@2.5'	2.5	1/19/04	920	2.2	57	18	99	67	1.9	<0.05	<0.05	<0.05	--	--	--
D-2@2.5'	2.5	1/19/04	44	0.13	0.083	1.5	4.2	1.1	0.38	<0.005	<0.005	0.35	--	--	--
D-3@2.5'	2.5	1/23/04	<1	<0.005	<0.005	<0.005	0.0092	0.11	0.02	<0.005	<0.005	0.0063	--	--	--
D-4@2.5'	2.5	1/23/04	4,700	8.8	120	63	390	41	3.4	<0.25	<0.25	<0.25	--	--	--
P-1@2.5'	2.5	1/20/04	10	0.49	0.085	0.15	0.22	2.1	0.10	<0.005	<0.005	0.14	--	--	--
P-2@2.5'	2.5	1/22/04	4.2	0.083	0.15	0.024	0.49	8.4	0.85	<0.005	<0.005	0.049	--	--	--
<i>Soil Samples Collected to Verify Removal of Impacted Soil During Remedial Excavation</i>															
EX-1	stockpile	1/19/04	53	0.87	6.4	1.2	6.0	8.5	<0.50	<0.005	<0.005	0.066	--	--	--
EX-2	stockpile	1/20/04	36	0.035	0.1	0.081	1.1	1.2	0.28	<0.025	<0.025	0.043	--	--	--
EX-3	stockpile	1/20/04	410	1.0	19	11	55	3.9	0.53	<0.10	<0.10	0.20	--	--	6.23
EX-4	stockpile	1/21/04	110	0.38	0.098	2.3	4.6	2.3	0.55	<0.005	<0.005	0.18	--	--	--
EX-5	stockpile	1/22/04	620	1.1	0.88	9.3	43	7.7	0.47	<0.025	<0.025	0.17	--	--	--
EX-6	stockpile	1/23/04	<1	0.0059	<0.005	<0.005	<0.005	0.24	0.1	<0.005	<0.005	0.0097	--	--	--



**Table 2**  
**SOIL ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Sample ID	Sample Depth (feet bgs)	Sample Date	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)	Lead (mg/kg)
<i>Confirmation Samples Collected from Sidewalls and Bottom of Remedial Excavation</i>															
EB-1@12'	12	1/20/04	<1	<0.005	<0.005	<0.005	<0.005	1.7	--	--	--	--	--	--	--
EB-2@7'	7	1/23/04	<1	<0.005	<0.005	<0.005	<0.005	0.098	--	--	--	--	--	--	--
EB-3@12'	12	1/23/04	<1	<0.005	<0.005	<0.005	<0.005	0.64	--	--	--	--	--	--	--
ES-1@8'	8	1/20/04	<1	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--
ES-2@8'	8	1/26/04	1.4	<0.005	<0.005	<0.005	<0.005	0.13	--	--	--	--	--	--	--
ES-3@8'	8	1/26/04	1.5	0.014	0.079	0.01	0.072	0.19	--	--	--	--	--	--	--
ES-4@8'	8	1/26/04	17	0.24	<0.025	0.51	0.99	1.8	--	--	--	--	--	--	--
ES-5@8'	8	1/26/04	5.8	0.077	0.012	0.071	0.18	0.27	--	--	--	--	--	--	--
ES-6@7'	7	1/26/04	<1	<0.005	<0.005	<0.005	<0.01	<0.005	--	--	--	--	--	--	--
ES-7@7'	7	1/26/04	1.3	<0.005	<0.005	<0.005	<0.01	<0.005	--	--	--	--	--	--	--



**Table 2**  
**SOIL ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Sample ID	Sample Depth (feet bgs)	Sample Date	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Methanol (mg/kg)	Ethanol (mg/kg)	Lead (mg/kg)
<i>Historical Investigation Soil Samples</i>															
B-1	10	5/7/97	27	0.057	0.15	1.4	2.7	<1.3	--	--	--	--	--	--	--
B-2	10	5/7/97	1.0	<0.005	0.0066	0.0079	0.009	0.084	--	--	--	--	--	--	--
B-3	4	12/2/99	<1	<0.005	<0.005	<0.005	<0.005	0.091	--	--	--	--	--	--	--
B-6	4	12/2/99	3.6	<0.005	<0.005	<0.005	0.0051	0.01	<0.5	<0.02	<0.02	<0.02	--	--	--
B-7	3.5	12/2/99	<1	<0.005	<0.005	<0.005	<0.005	0.023	<0.5	<0.02	<0.02	<0.02	--	--	--
B-8	4	12/2/99	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5	<0.02	<0.02	<0.02	--	--	--
B-9	4	12/2/99	3.5	0.013	<0.005	<0.005	0.037	1.1	<0.5	<0.02	<0.02	<0.02	--	--	--
B-10	4	12/2/99	<1	<0.005	<0.005	<0.005	<0.005	0.61	<0.5	<0.02	<0.02	0.025	--	--	--
B-11	5	8/31/00	1.1	0.0052	<0.005	<0.005	<0.005	0.083	<0.005	<0.005	<0.005	<0.005	<0.02	<0.01	--
B-11	10	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	0.14	<0.005	<0.005	<0.005	<0.005	<0.02	<0.01	--
MW-1	5	8/31/00	<1	<0.005	<0.005	<0.005	<0.05	0.018	0.0072	<0.005	<0.005	<0.005	<0.02	<0.01	--
MW-1	10	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	0.025	<0.005	<0.005	<0.005	<0.005	<0.02	<0.01	--
MW-2	5	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	0.60	0.034	<0.005	<0.005	0.0095	<0.8	0.03	--
MW-2	10	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	0.62	0.014	<0.005	<0.005	0.01	<0.8	<0.01	--
MW-3	5	8/31/00	13	0.21	0.0062	0.099	0.026	5.9	1.2	<0.005	<0.005	0.21	<1	<0.05	--
MW-3	10	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	1.6	0.86	<0.005	<0.005	0.11	<0.5	<0.02	--
MW-4	5	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.2	<0.01	--
MW-4	10	8/31/00	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.2	<0.01	--
MW-5	5	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.2	<0.01	--
MW-5	10	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02	--
MW-5	15	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02	--
MW-6	10	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.4	<0.02	--
MW-6	15	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.4	<0.02	--
MW-7	10	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.2	<0.01	--
MW-7	15	11/8/01	<1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.2	<0.02	--

**Notes**

bgs: below ground surface

"--" Not analyzed, available or applicable

mg/kg = milligrams per kilogram

<###: Not detected above the method detection limit as shown

TPHg: Total petroleum hydrocarbons as gasoline by EPA Method 5030/8260B

BTEX by EPA Method 8260B

MTBE: Methyl tertiary butyl ether by EPA 8260B

TBA: Tertiary butanol by EPA 8260B

DIPE: Di isopropyl ether by EPA 8260B

ETBE: Ethyl tertiary butyl ether by EPA 8260B

TAME: Tertiary amyl methyl ether by EPA 8260B

Methanol: by EPA Method 8260B

Ethanol: by EPA method 8260B

Lead: Total Lead by EPA method 6010B



**Table 3**  
**GROUNDWATER ELEVATIONS**  
**AND ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Name	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)	Lead (µg/L)	DO (mg/L)
<i>Grab Groundwater Samples</i>																			
B-1	5/7/97	---	---	0.00	---	9,900	880	52	650	690	100,000	---	---	---	---	---	---	---	---
B-2	5/7/97	---	---	0.00	---	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<1	<1	<1	---	---	---	---
B-6	12/2/99	---	~4.5	0.00	---	550	0.84	0.52	<0.5	<0.5	190	<10	<1	<1	11	---	---	---	---
B-7	12/2/99	---	~4	0.00	---	<250	<1	<1	<1	<1	1,200	<50	<2.5	<2.5	13	---	---	---	---
B-8	12/2/99	---	~4.5	0.00	---	<50	<0.5	<0.5	<0.5	<0.5	3.3	<10	<1	<1	<1	---	---	---	---
B-9	12/2/99	---	~5	0.00	---	2,600	39	<10	<10	<10	12,000	1,200	<25	<25	220	---	---	---	---
B-10	12/2/99	---	~5	0.00	---	2,600	<10	<10	<10	<10	13,000	780	<25	<25	380	---	---	---	---
B-11	8/31/00	---	~11	0.00	---	54	<0.5	<0.5	<0.5	1.3	340	<5	<0.5	<0.5	4.9	<100	<10	---	---
Pit Water	1/15/04	---	---	sheen	---	42,000	740	5,900	1,200	4,600	13,000	2,000	<25	<25	57	---	---	---	---
Pit Water	1/20/04	---	---	0.00	---	16,000	95	610	270	840	4,300	---	---	---	---	---	---	16	---
Water Tank	3/19/04	---	---	0.00	---	140	<0.5	<0.5	<0.5	<1	180	---	---	---	---	---	---	---	---
<i>Monitoring Well Groundwater Samples</i>																			
MW-1	9/11/00	98.70	6.11	0.00	92.59	<50	<0.3	<0.3	<0.3	<0.6	28.2	<500	<0.5	<0.5	<0.5	---	---	---	---
	10/16/00	98.70	6.11	0.00	92.59	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Screen	11/16/00	98.70	4.73	0.00	93.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3'-20'	12/12/00	98.70	4.60	0.00	94.10	<50	<0.3	<0.3	<0.3	<0.6	87	<500	<0.5	<0.5	22	---	---	---	---
	1/22/01	98.70	4.99	0.00	93.71	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2/16/01	98.70	4.70	0.00	94.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	3/8/01	98.70	4.53	0.00	94.17	120	<0.5	<0.5	<0.5	44	42	<5	<0.5	<0.5	9	<50	<5	---	---
	6/6/01	98.70	5.51	0.00	93.19	<50	<0.5	<0.5	<0.5	<0.5	37	8.7	<0.5	<0.5	2.5	<200	<5	---	---
	9/4/01	98.70	6.37	0.00	92.33	<50	<0.5	<0.5	<0.5	<0.5	61	<5	<0.5	<0.5	2.3	---	---	---	---
	11/16/01	12.81	4.18	0.00	8.63	<50	<0.5	<0.5	<0.5	<0.5	15	<5	<0.5	<0.5	1.8	<100	<5	---	---
	2/8/02	12.81	3.98	0.00	8.83	<50	<0.5	<0.5	<0.5	<0.5	40	9.4	<0.5	<0.5	3.4	---	---	---	---
	5/3/02	12.81	4.53	0.00	8.28	<50	<0.5	<0.5	<0.5	<0.5	11	8.8	<0.5	<0.5	1.1	---	---	---	---
	8/29/02	16.19	6.26	0.00	9.93	<50	<0.5	<0.5	<0.5	<0.5	17	16	<0.5	<0.5	1.4	---	---	---	---
	11/14/02	16.19	5.95	0.00	10.24	<50	<0.5	<0.5	<0.5	<0.5	11	<5	<0.5	<0.5	1.2	---	---	---	---
	2/11/03	16.19	4.54	0.00	11.65	<50	<0.5	<0.5	<0.5	<0.5	8.2	10	<0.5	<0.5	0.9	---	---	---	---
	5/7/03	16.19	4.07	0.00	12.12	<50	<0.5	<0.5	<0.5	<0.5	9.1	13	<0.5	<0.5	0.76	---	---	---	---
	8/4/03	16.19	5.80	0.00	10.39	<50	<0.5	<0.5	<0.5	<0.5	6.4	10	<0.5	<0.5	0.81	---	---	---	---
	11/3/03	16.19	6.54	0.00	9.65	<50	<0.5	<0.5	<0.5	<0.5	8.3	<5	<0.5	<0.5	0.72	---	---	---	---
	3/8/04	16.19	4.04	0.00	12.15	<50	<0.5	<0.5	<0.5	<0.5	20	<5	<0.5	<0.5	<0.5	---	---	---	0.25
	3/18/04	MW-1 was destroyed during new UST system installation activities.																	



Table 3  
GROUNDWATER ELEVATIONS  
AND ANALYTICAL DATA  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Name	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)	Lead (µg/L)	DO (mg/L)
MW-2	9/11/00	98.10	5.19	0.00	92.91	1,120	<0.3	<0.3	<0.3	<0.6	3,130	<500	<0.5	<0.5	40.3	---	---	---	---
	10/16/00	98.10	5.21	0.00	92.89	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Screen	11/16/00	98.10	3.87	0.00	94.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12/12/00	98.10	4.88	0.00	93.22	423	<0.3	<0.3	<0.3	<0.6	2,020	<500	<0.5	<0.5	<0.5	---	---	---	---
3'-20'	1/22/01	98.10	4.21	0.00	93.89	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2/16/01	98.10	4.01	0.00	94.09	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	3/8/01	98.10	3.92	0.00	94.18	<200	<2	<2	<2	<2	1,400	<20	<2	<2	18	<500	<20	---	---
	6/6/01	98.10	4.74	0.00	93.36	<500	<5	<5	<5	<5	1,200	<50	<5	<5	20	6,000	<50	---	---
	9/4/01	98.10	5.64	0.00	92.46	<50	<0.5	<0.5	<0.5	<0.5	1,100	100	<0.5	<0.5	17	---	---	---	---
	11/16/01	12.23	3.85	0.00	8.38	<100	<1	<1	<1	<1	710	18	<1	<1	12	<2,000	<10	---	---
	2/8/02	12.23	3.46	0.00	8.77	1,300	19	<10	<10	<10	3,600	140	<10	<10	100	---	---	---	---
	5/3/02	12.23	3.93	0.00	8.30	<1,000	<10	<10	<10	<10	4,300	250	<10	<10	150	---	---	---	---
	8/29/02	15.61	5.55	0.00	10.06	<1,000	<10	<10	<10	<10	3,100	<100	<10	<10	87	---	---	---	---
	11/14/02	15.61	5.24	0.00	10.37	220	<1	<1	<1	<1	2,200	16	<1	<1	67	---	---	---	---
	2/11/03	15.61	3.97	0.00	11.64	<1,000	11	<10	<10	<10	4,400	170	<10	<10	160	---	---	---	---
	5/7/03	15.61	3.53	0.00	12.08	<1,000	<10	<10	<10	<10	4,200	210	<10	<10	170	---	---	---	---
	8/4/03	15.61	5.05	0.00	10.56	<500	<5	<5	<5	<5	2,100	<50	<5	<5	64	---	---	---	---
	11/3/03	15.61	6.02	0.00	9.59	<500	<5	<5	<5	<5	1,800	<50	<5	<5	58	---	---	---	---
	3/8/04	15.61	3.87	0.00	11.74	<1,000	<10	<10	<10	<10	4,200	150	<10	<10	150	---	---	---	0.52
	5/17/04	15.61	4.62	0.00	10.99	<1,000	<10	<10	<10	<20	940	<100	<10	<10	34	---	---	---	0.76
	8/2/04	15.61	5.31	0.00	10.30	<200	<2	<2	<2	<2	1,000	---	---	---	---	---	---	---	1.53
	11/1/04	15.61	4.17	0.00	11.44	<200	<1.5	<1.5	<1.5	<1.5	700	---	---	---	---	---	---	---	1.19
	2/3/05	15.61	3.78	0.00	11.83	<200	<1.5	<1.5	<1.5	<1.5	1,100	---	---	---	---	---	---	---	1.90
	5/2/05	15.61	4.10	0.00	11.51	<150	<1.5	<1.5	<1.5	<1.5	820	---	---	---	---	---	---	---	0.57
	8/3/05	15.61	4.78	0.00	10.83	<50	<0.5	<0.5	<0.5	<0.5	370	---	---	---	---	---	---	---	0.85
	11/4/05	15.61	4.01	0.00	11.60	<50	<0.5	<0.5	<0.5	<0.5	360	---	---	---	---	---	---	---	1.34
MW-3	9/11/00	99.58	5.39	0.00	94.19	6,390	186	5	10.4	10.7	12,500	<500	<0.5	<0.5	1,150	---	---	---	---
	10/16/00	99.58	6.36	0.00	93.22	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Screen	11/16/00	99.58	4.84	0.00	94.74	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12/12/00	99.58	4.76	0.00	94.82	29,200	499	<150	<150	<300	41,100	<250,000	<250	<250	2,280	---	---	---	---
3'-20'	1/22/01	99.58	5.27	0.00	94.31	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2/16/01	99.58	4.91	0.00	94.67	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	3/8/01	99.58	4.79	0.00	94.79	3,100	230	130	35	62	6,900	2,100	<10	<10	290	<10,000	<200	---	---
	6/6/01	99.58	5.93	0.00	93.65	<5,000	190	<25	<25	<25	16,000	5,000	<25	<25	530	<10,000	<1,000	---	---
	9/4/01	99.58	6.84	0.00	92.74	4,700	230	100	25	88	16,000	7,000	<20	<20	990	---	---	---	---
	11/16/01	13.70	4.55	0.00	9.15	10,000	720	590	250	970	22,000	4,200	<50	<50	1,200	<120,000	<500	---	---
	2/8/02	13.70	3.90	0.00	9.80	4,200	170	26	54	75	6,000	920	<20	<20	260	---	---	---	---
	5/3/02	13.70	4.62	0.00	9.08	2,700	110	<20	26	22	9,500	3,400	<20	<20	790	---	---	---	---



**Table 3**  
**GROUNDWATER ELEVATIONS**  
**AND ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Name	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)	Lead (µg/L)	DO (mg/L)
MW-3 Screen 3'-20'	8/29/02	17.08	6.74	0.00	10.34	1,800	80	<10	<10	<10	4,700	1,200	<10	<10	540	---	---	---	---
	11/14/02	17.08	6.38	0.00	10.70	4,300	120	<20	<20	<20	8,600	1,800	<20	<20	1,400	---	---	---	---
	2/11/03	17.08	4.73	0.00	12.35	4,500	200	<20	27	<20	11,000	2,800	<20	<20	760	---	---	---	---
	5/7/03	17.08	4.15	0.00	12.93	2,800	120	<20	26	<20	5,700	1,200	<20	<20	430	---	---	---	---
	8/4/03	17.08	6.25	0.00	10.83	1,900	79	<10	<10	<10	5,500	1,500	<10	<10	420	---	---	---	---
	11/3/03	17.08	6.88	0.00	10.20	1,900	75	<10	<10	<10	4,600	1,500	<10	<10	380	---	---	---	---
	1/20/04	Removed during remedial soil excavation activities																	
MW-4 Screen 3'-20'	9/11/00	100.50	7.07	0.00	93.43	<50	0.4	<0.3	<0.3	<0.6	<10	<500	<0.5	<0.5	3.7	---	---	---	---
	10/16/00	100.50	7.97	0.00	92.53	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11/16/00	100.50	5.45	0.00	95.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12/12/00	100.50	6.08	0.00	94.42	<50	<0.3	<0.3	<0.3	<0.6	2	<500	<0.5	<0.5	<0.5	---	---	---	---
	1/22/01	100.50	5.79	0.00	94.71	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	2/16/01	100.50	5.29	0.00	95.21	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	3/8/01	100.50	5.22	0.00	95.28	<50	<0.5	<0.5	<0.5	<0.5	0.94	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	6/6/01	100.50	6.52	0.00	93.98	<50	<0.5	<0.5	<0.5	<0.5	0.57	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	9/4/01	100.50	7.56	0.00	92.94	<50	<0.5	<0.5	<0.5	<0.5	0.78	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/16/01	14.59	4.96	0.00	9.63	<50	<0.5	<0.5	<0.5	<0.5	0.58	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	2/8/02	14.59	4.74	0.00	9.85	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/3/02	14.59	5.04	0.00	9.55	<50	<0.5	<0.5	<0.5	<0.5	1.3	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/29/02	17.97	7.42	0.00	10.55	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/14/02	17.97	7.02	0.00	10.95	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	2/11/03	17.97	5.11	0.00	12.86	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/7/03	17.97	4.53	0.00	13.44	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/4/03	17.97	6.94	0.00	11.03	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/3/03	17.97	7.61	0.00	10.36	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	3/8/04	17.97	5.04	0.00	12.93	<50	<0.5	<0.5	<0.5	<0.5	3.9	<5	<0.5	<0.5	<0.5	---	---	---	0.12
	5/17/04	17.97	6.73	0.00	11.24	<50	<0.5	<0.5	<0.5	<0.5	5.2	<5	<0.5	<0.5	<0.5	---	---	---	0.84
	8/2/04	17.97	6.89	0.00	11.08	<50	<0.5	<0.5	<0.5	<0.5	43	---	---	---	---	---	---	---	1.99
	11/1/04	17.97	5.66	0.00	12.31	<50	<0.5	<0.5	<0.5	<0.5	2.8	---	---	---	---	---	---	---	1.38
	2/3/05	17.97	5.01	0.00	12.96	<50	<0.5	<0.5	<0.5	<0.5	1.0	---	---	---	---	---	---	---	1.92
	5/2/05	17.97	5.59	0.00	12.38	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.52
	8/3/05	17.97	6.52	0.00	11.45	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.88
	11/4/05	17.97	5.74	0.00	12.23	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.89
MW-5 Screen 3'-20'	11/16/01	12.27	5.18	0.00	7.09	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	2/8/02	12.27	4.39	0.00	7.88	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/3/02	12.27	4.56	0.00	7.71	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/29/02	15.64	5.97	0.00	9.67	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---



Table 3  
GROUNDWATER ELEVATIONS  
AND ANALYTICAL DATA  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Name	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)	Lead (µg/L)	DO (mg/L)
MW-5 Screen 3'-20'	11/14/02	15.64	5.80	0.00	9.84	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	2/11/03	15.64	4.59	0.00	11.05	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/7/03	15.64	4.33	0.00	11.31	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/4/03	15.64	5.48	0.00	10.16	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/3/03	15.64	6.57	0.00	9.07	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	3/8/04	15.64	4.49	0.00	11.15	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	0.38
	5/17/04	15.64	4.98	0.00	10.66	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	0.78
	8/2/04	15.64	5.69	0.00	9.95	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	1.89
	11/1/04	15.64	4.86	0.00	10.78	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	1.36
	2/3/05	15.64	4.60	0.00	11.04	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	2.29
	5/2/05	15.64	4.64	0.00	11.00	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.67
	8/3/05	15.64	5.22	0.00	10.42	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	1.14
	11/4/05	15.64	4.93	0.00	10.71	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.79
MW-6 Screen 3'-20'	11/16/01	11.41	4.51	0.00	6.90	<50	<0.5	<0.5	<0.5	<0.5	<b>0.90</b>	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	2/8/02	11.41	4.15	0.00	7.26	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/3/02	11.41	4.13	0.00	7.28	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/29/02	14.78	5.36	0.00	9.42	<50	<0.5	<0.5	<0.5	<0.5	<b>0.68</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/14/02	14.78	5.19	0.00	9.59	<50	<0.5	<0.5	<0.5	<0.5	<b>1.0</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	2/11/03	14.78	4.16	0.00	10.62	<50	<0.5	<0.5	<0.5	<0.5	<b>0.80</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/7/03	14.78	3.90	0.00	10.88	<50	<0.5	<0.5	<0.5	<0.5	<b>0.60</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/4/03	14.78	4.90	0.00	9.88	<50	<0.5	<0.5	<0.5	<0.5	<b>0.65</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/3/03	14.78	6.11	0.00	8.67	<50	<0.5	<0.5	<0.5	<0.5	<b>1.5</b>	<5	<0.5	<0.5	<0.5	---	---	---	---
	3/8/04	14.78	4.08	0.00	10.70	<50	<0.5	<0.5	<0.5	<0.5	<b>0.51</b>	<5	<0.5	<0.5	<0.5	---	---	---	0.12
	5/17/04	14.78	4.42	0.00	10.36	<50	<0.5	<0.5	<0.5	<0.5	<b>0.60</b>	<5	<0.5	<0.5	<0.5	---	---	---	0.80
	8/2/04	14.78	5.07	0.00	9.71	<50	<0.5	<0.5	<0.5	<0.5	<b>0.72</b>	---	---	---	---	---	---	---	1.73
	11/1/04	14.78	4.32	0.00	10.46	<50	<0.5	<0.5	<0.5	<0.5	<b>2.3</b>	---	---	---	---	---	---	---	1.23
	2/3/05	14.78	4.15	0.00	10.63	<50	<0.5	<0.5	<0.5	<0.5	<b>0.68</b>	---	---	---	---	---	---	---	2.34
	5/2/05	14.78	4.19	0.00	10.59	<50	<0.5	<0.5	<0.5	<0.5	<b>0.56</b>	---	---	---	---	---	---	---	0.61
	8/3/05	14.78	4.60	0.00	10.18	<50	<0.5	<0.5	<0.5	<0.5	<b>0.62</b>	---	---	---	---	---	---	---	0.49
	11/4/05	14.78	4.34	0.00	10.44	<50	<0.5	<0.5	<0.5	<0.5	<b>1.0</b>	---	---	---	---	---	---	---	1.20



**Table 3**  
**GROUNDWATER ELEVATIONS**  
**AND ANALYTICAL DATA**  
Former Cash Oil Arcata  
421 J Street  
Arcata, California  
Blue Rock Project No. NC-003

Well Name	Sample Date	TOC (feet)	DTW (feet)	SPH (feet)	GWE (feet)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Methanol (µg/L)	Ethanol (µg/L)	Lead (µg/L)	DO (mg/L)
MW-7	11/16/01	11.91	5.19	0.00	6.72	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<50	<5	---	---
	2/8/02	11.91	4.67	0.00	7.24	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
Screen	5/3/02	11.91	5.06	0.00	6.85	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
3'-20'	8/29/02	15.28	6.20	0.00	9.08	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/14/02	15.28	5.83	0.00	9.45	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	2/11/03	15.28	5.12	0.00	10.16	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	5/7/03	15.28	4.75	0.00	10.53	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	8/4/03	15.28	5.77	0.00	9.51	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	11/3/03	15.28	6.84	0.00	8.44	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	---
	3/8/04	15.28	4.96	0.00	10.32	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	0.15
	5/17/04	15.28	5.23	0.00	10.05	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	---	---	---	0.69
	8/2/04	15.28	6.06	0.00	9.22	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	1.64
	11/1/04	15.28	5.26	0.00	10.02	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	1.28
	2/3/05	15.28	4.97	0.00	10.31	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	2.31
	5/2/05	15.28	5.01	0.00	10.27	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.58
	8/3/05	15.28	5.50	0.00	9.78	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.55
	11/4/05	15.28	5.07	0.00	10.21	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	0.49
MCL						---	1	150	300	1,750	13								
Taste & odor threshold						5	---	42	29	17	---								
NCRWQCB Cleanup Goals						<50	0.5	42	29	17	5								

Notes :

TOC: Top of well casing surveyed to established benchmark.

DTW: Depth to water as referenced to top of casing.

SPH: Separate phase hydrocarbon on top of groundwater.

GWE: Groundwater elevation as referenced to benchmark.

µg/L = micrograms per liter = parts per billion = ppb

MCL: maximum contaminant level, a Federal drinking water standard

<###: Not detected in concentrations exceeding the indicated laboratory detection limit

DO: Dissolved oxygen collected using YSI meter (downhole measurement)

TPHg: Total petroleum hydrocarbons as gasoline by Method 5030/8260B

MTBE: Methyl tertiary butyl ether by Method 8260B

TBA: Tertiary butyl alcohol by Method 8260B

DIPE: Di isopropyl ether by Method 8260B

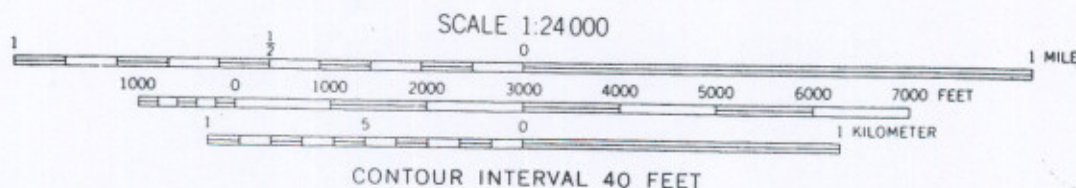
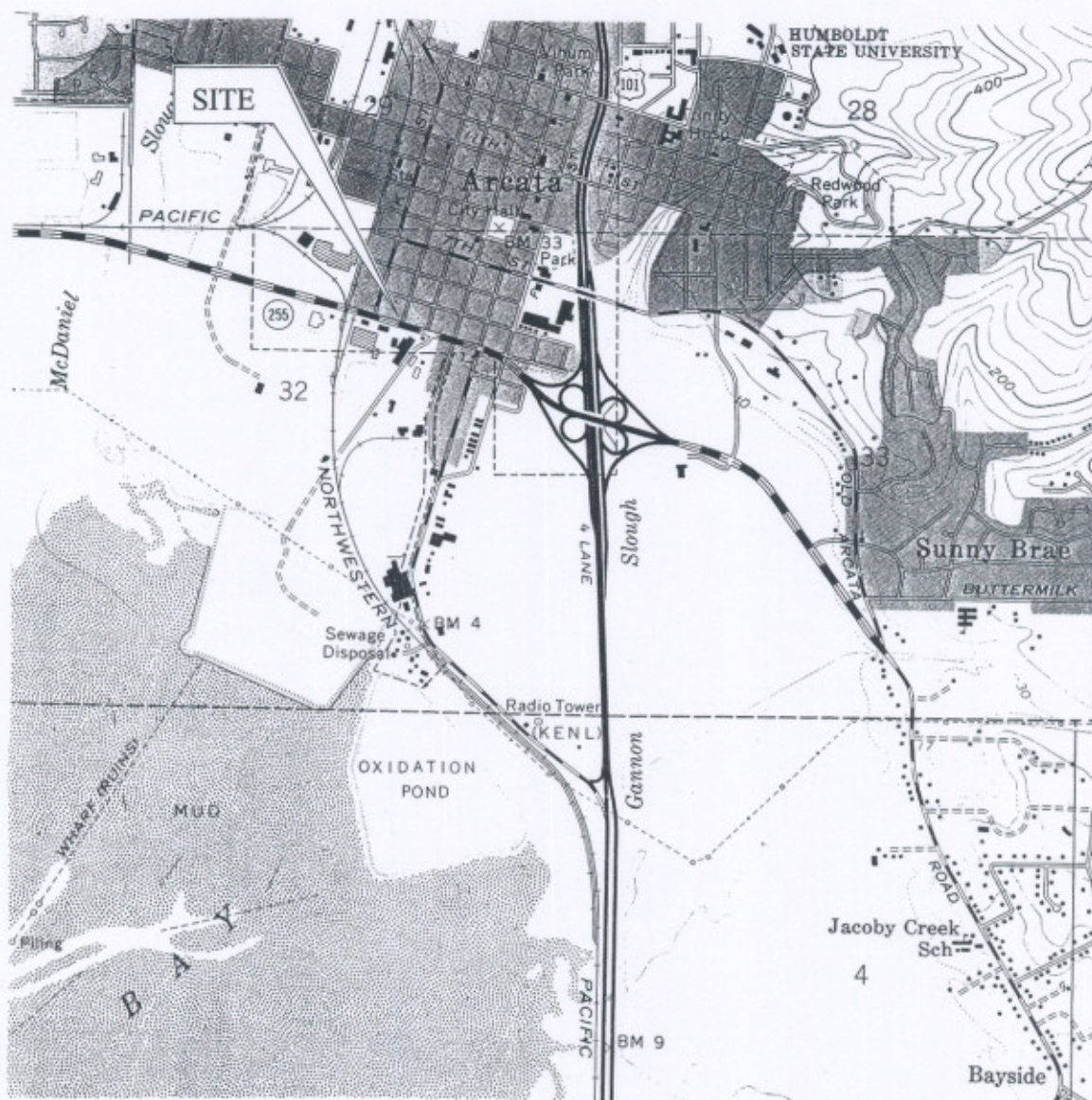
ETBE: Ethyl tertiary butyl ether by Method 8260B

TAME: Tertiary amyl methyl ether by Method 8260B

Lead: Dissolved lead by EPA Method 200.9

NCRWQCB: North Coast Region Water Quality Control Board





QUADRANGLE LOCATION

MAP SOURCE: USGS Arcata South  
Quadrangle



## Site Location Map

Former Cash Oil Arcata  
421 J Street  
Arcata, California



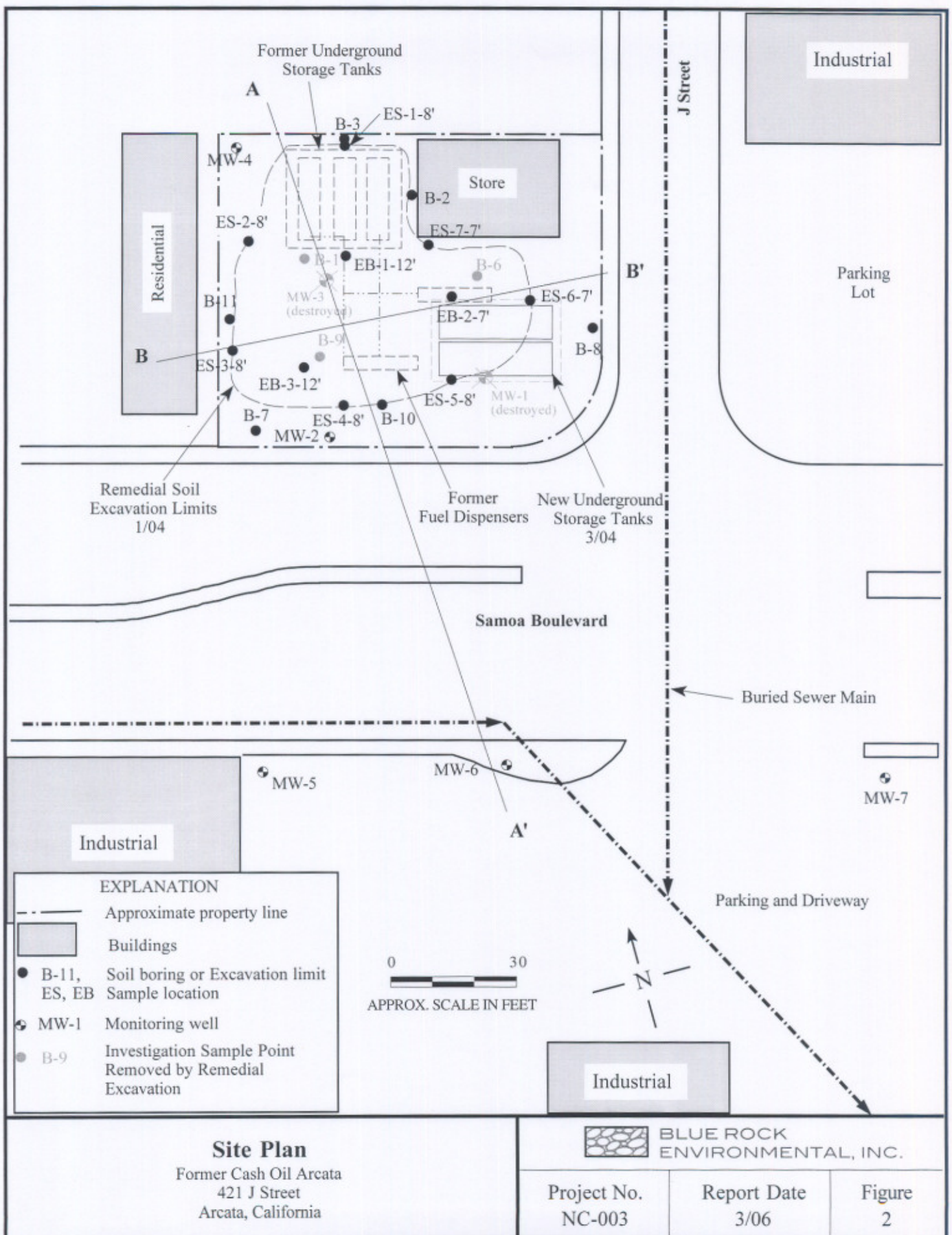
BLUE ROCK  
ENVIRONMENTAL, INC.

Project No.  
NC-003

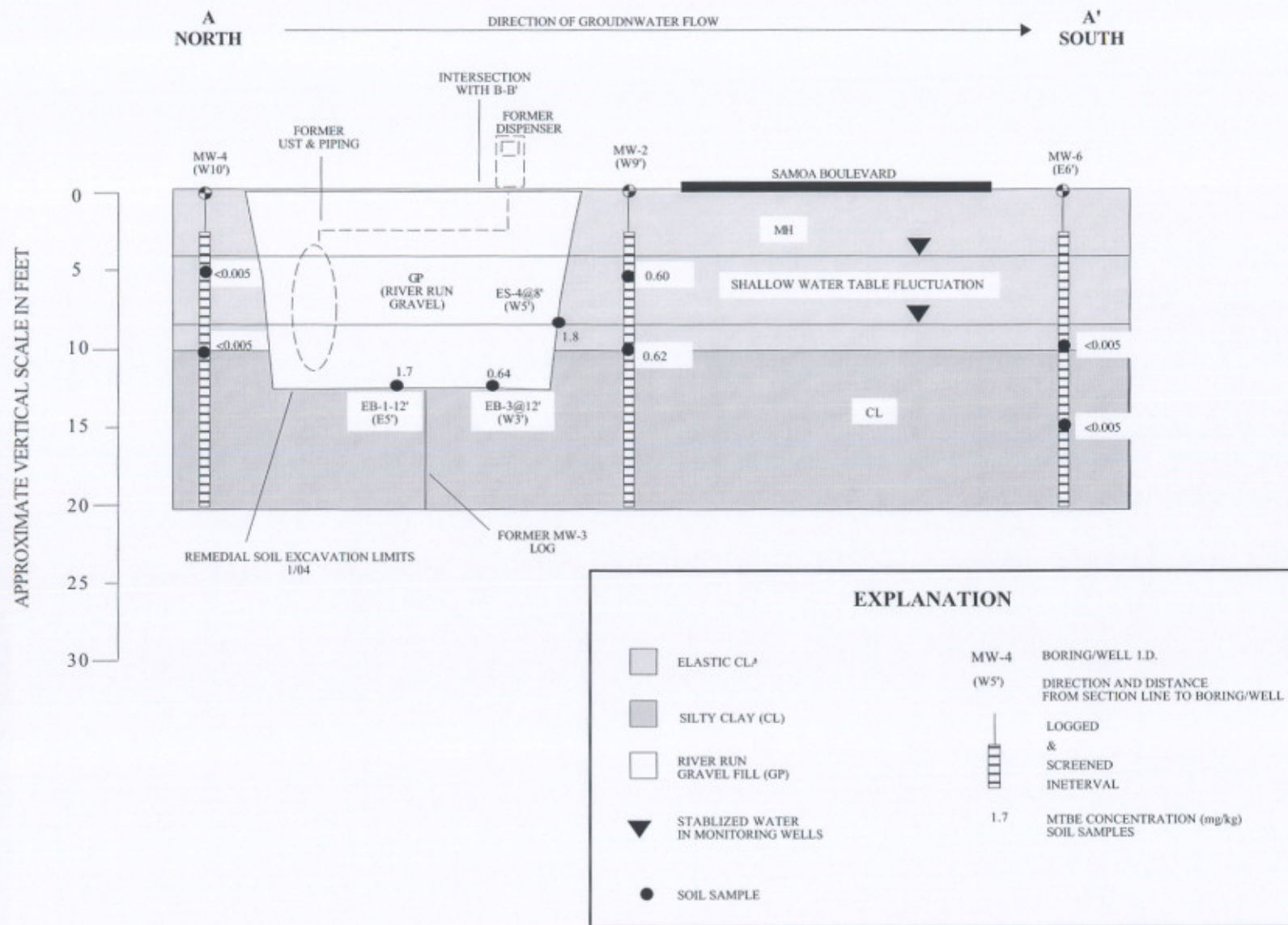
Date  
4/04

Figure  
1









0' 30'

APPROXIMATE SCALE  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=10'

10'

**Cross-Section A-A'**  
Former Cash Oil Arcata  
421 J Street  
Arcata, CA



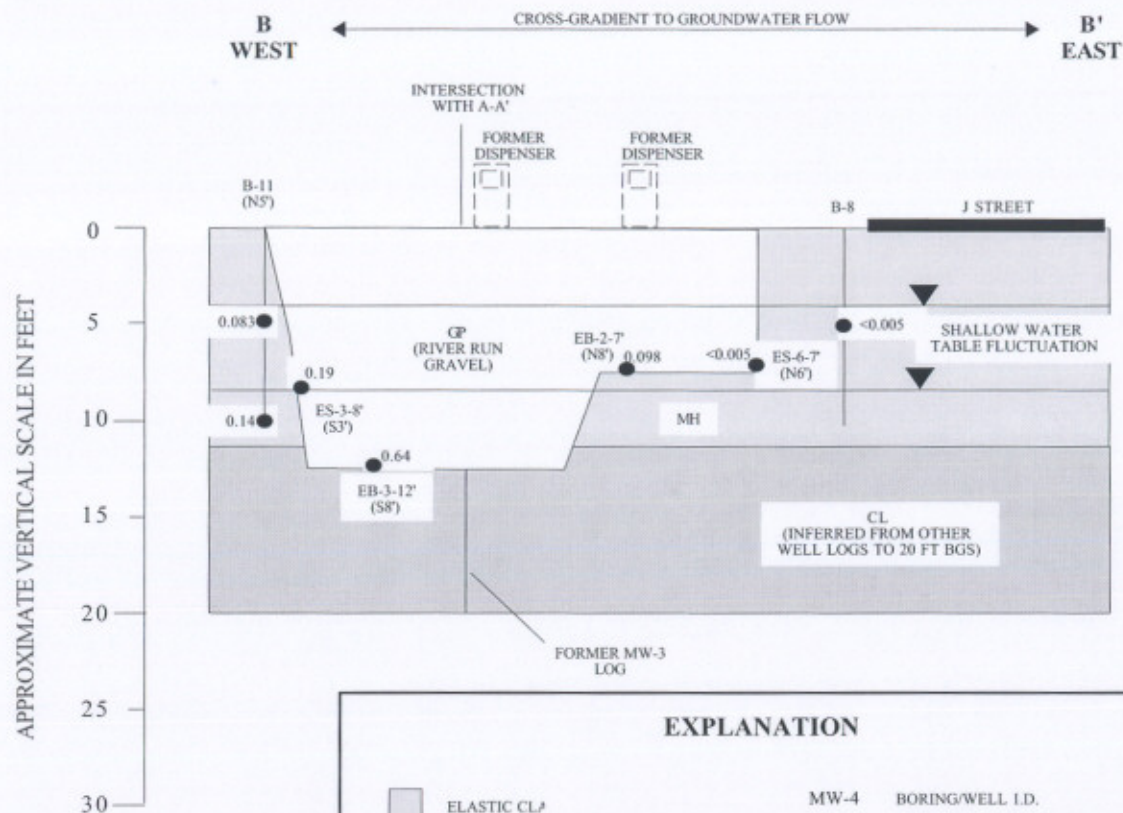
BLUE ROCK  
ENVIRONMENTAL, INC.

Project No.  
NC-3

Figure Date  
3/06

Figure  
2a





0' 30'

10'

APPROXIMATE SCALE  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=10'

**Cross-Section B-B'**  
Former Cash Oil Arcata  
421 J Street  
Arcata, CA



BLUE ROCK  
ENVIRONMENTAL, INC.

Project No.  
NC-3

Figure Date  
3/06

Figure  
2b



